

ABSTRACT

A method for casting-in-place composite and/or non-filled structures which are useful as sorptive or reactive media or for size-based separations. Any particular housing size or configuration can be used, and the inclusion of a large amount of adsorptive particles in polymer is achieved while still maintaining the membrane three dimensional structure. In a first preferred embodiment, the composite structures comprise particles entrapped within a porous polymeric substrate, and are cast in-place into a housing such as a pipette tip, thereby providing an effective platform for micromass handling. With the appropriate selection of particle chemistry, virtually any separation or purification operation can be conducted, including selective bind/elute chromatography operations, on sample mass loads less than 1 microgram in volumes of a few microliters, as well as larger mass loads and volumes. The present invention also encompasses the composite structures as well as sample preparation devices containing the same. In a second preferred embodiment, self-retaining, self-supporting structures are cast *in situ* in a suitable housing and can be used for size-based separations wherein the cast structure acts as a semi-permeable barrier. The present invention also encompasses these structures as well as housings containing these structures.